REMARKS

Reconsideration of this application is respectfully requested. The allowance of claims 16-21 is appreciated.

The changes to the specification overcome the PTO objections and better conform the reference numerals used in the specification to the reference numerals in the drawings. In the drawings, reference numerals (19) and (25) have been deleted from Figure 1 as they are not referenced in the specification; reference numeral (54) used in Figure 2 has been replaced with reference number (42) which represents the end section of the coil; reference number (66) has been added to Figure 4 to identify the "dowel" that is referenced on page 21, line 17 of the specification; the collector rings have been renumbered as (78) in Figure 5 and in page 10, line 20, and the end of the rotor core has been renumbered as "156" on Figure 5 to correspond to a similar amendment made in paragraph 72 on page 24 of the specification. The reference to the channel (58) in the split plate is shown in Figure 4. In particular, the channel (58) is shown in Figure 4 in the upper left quadrant of that figure. The channel receives coil winding (34). The drawings and specification are believed to be in good condition for allowance.

The rejection of claims 1-5, 10, 12 and 13 as being anticipated by Driscoll et al. (U.S. Patent 6,169,353) is traversed. Further, this rejection has been overcome by amendment of independent claim 1 to require the coil windings to have a "end section extending beyond an end of the rotor core". Driscoll shows the end sections of the coil seated in channels on the surface of the rotor core. No portion of the Driscoll coil winding extends beyond any end of the rotor core. Accordingly, Driscoll does not teach

winding extends beyond any end of the rotor core. Accordingly, Driscoll does not teach the claimed invention and should be withdrawn.

The rejection of claim 9 as being obvious over Driscoll in view of Kalsi (U.S. Patent No. 6,066,906) is traversed. Kalsi also does not teach or suggest a coil winding extending beyond an end of a rotor core. Driscoll and Kalsi do not render obvious a superconducting coil winding having an end section extending beyond the end of a rotor core.

The rejection of dependent claims 14 and 15 as being obvious over Driscoll in view of Laskaris '248 (U.S. Patent No. 4,385,248) is traversed for substantially the same reasons as stated above. In particular, Laskaris '248 does not teach or suggest that the end section of the saddle coil extend beyond a rotor core end. Further, Laskaris '248 does not suggest modifying Driscoll such that the end of the coil extend beyond an end of the rotor core. Accordingly, claims 14 and 15 are not obvious and the rejection should be withdrawn.

The rejection of claims 6 and 8 as being obvious over Driscoll in view of Ueda (U.S. Patent No. 4,642,503) is traversed. Ueda in Figures 3, 8, 9, 12, 15, 16, 20 and 23 show a rotor core having channels to support the end section of coil windings. Ueda does not disclose or suggest a superconducting coil winding having an end section extending beyond the end of a rotor core. Claims 6 and 8 (which depend on modified claim 1) define subject matter that would not have been rendered obvious over the combination of Driscoll and Ueda which in combination disclose a rotor core having channels for the entirety (including end sections) of the coil windings.

All claims are in good condition for allowance. If any small matter remains outstanding, the Examiner is requested to telephone applicants' attorney. Prompt reconsideration and allowance of this application is requested.

Attached hereto is a marked-up version of the changes made to the specification and claim(s) by the current amendment. The attached page(s) is captioned **"Version With Markings To Show Changes Made."**

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION

[0002] INTENTIONALLY LEFT BLANK -- DELETED

[0003] U.S. Patent Application Serial No. [__/___,___] 09/854,933 entitled "High Temperature Super-Conducting Rotor Coil Support With Split Coil Housing And Assembly Method", filed May 15, 2001 (atty. dkt. 839-1006);

[0004] U.S. Patent Application Serial No. [__/___,___] 09/854,931 entitled "Synchronous Machine Having Cryogenic Gas Transfer Coupling To Rotor With Super-Conducting Coils", filed May 15, 2001 (atty. dkt. 839-1007);

[0005] U.S. Patent Application Serial No. [__/___,___] 09/855,026 entitled "High Temperature Super-Conducting Synchronous Rotor Coil Support With Tension Rods And Method For Assembly Of Coil Support", filed May 15, 2001 (atty. dkt. 839-1008);

[0006] U.S. Patent Application Serial No. [__/___,___] 09/854,946 entitled "High Temperature Super-Conducting Rotor Coil Support With Tension Rods And Bolts And Assembly Method", filed May 15, 2001 (atty. dkt. 839-1009);

[0007] U.S. Patent Application Serial No. [__/___,___] 09/854,939 entitled "High Temperature Super-Conducting Coils Supported By An Iron Core Rotor", filed May 15, 2001 (atty. dkt. 839-1010);

[0008] U.S. Patent Application Serial No. [__/___,___] 09/854,938 entitled "High Temperature Super-Conducting Synchronous Rotor Having An Electromagnetic Shield And Method For Assembly", filed May 15, 2001 (atty. dkt. 839-1011);

[0009] U.S. Patent Application Serial No. [__/___,___] 09/854,940 entitled "High Temperature Super-Conducting Rotor Coil Support And Coil Support Method", filed May 15, 2001 (atty. dkt. 839-1012);

[0010] U.S. Patent Application Serial No. [__/___,___] 09/854,937 entitled "High Temperature Super-Conducting Rotor Having A Vacuum Vessel And Electromagnetic Shield And Method For Assembly", filed May 15, 2001 (atty. dkt. 839-1016);

[0011] U.S. Patent Application Serial No. [__/___,___] 09/854,944 entitled "A High Power Density Super-Conducting Electric Machine", filed May 15, 2001 (atty. dkt. 839-1019);

[0012] U.S. Patent Application Serial No. [__/___,___] 09/854,943 entitled "Cryogenic Cooling System For Rotor Having A High Temperature Super-Conducting Field Winding", filed May 15, 2001 (atty. dkt. 839-1062);

[0013] U.S. Patent Application Serial No. [__/___,___] 09/854,464 entitled "High Temperature Super-Conducting Racetrack Coil", filed May 15, 2001 (atty. dkt. 839-1063); and

[0014] U.S. Patent Application Serial No. [__/___,___] 09/855,034 entitled "High Temperature Super Conducting Rotor Power Leads", filed May 15, 2001 (atty. dkt. 839-1064).

The paragraph beginning at page 10, line 15:

The rotor includes a pair of end shafts 24, 30 that brace the core 22 and are supported by bearings and can be coupled to external devices. The collector end shaft 24

includes a collector rings [79] 78 that provide an external electrical connection for the connections 79 on the coil 36 of the coil winding 34. In addition, the collector end shaft has a cryogen transfer coupling 26 to a source of cryogenic cooling fluid used to cool the SC coil windings in the rotor. The cryogen transfer coupling 26 includes a stationary segment coupled to a source of cryogen cooling fluid and a rotating segment which provides cooling fluid to the HTS coil. The drive end shaft 30 includes a power coupling 32 to a driving turbine, for example.

The paragraph beginning at page 12, line 1:

Fluid passages 38 for cryogenic cooling fluid are included in the coil winding 34. These passages may extend around an outside edge of the SC coil 36. The passageways provide cryogenic cooling fluid to remove heat from those coils by conduction heat transfer. The cooling fluid maintains the low temperatures, e.g., 27°K, in the SC coil winding needed to promote super-conducting conditions, including the absence of electrical resistance in the coil. The cooling passages have an input ports [31] 39 and output ports 41 at one end of the rotor core. These ports 39, 41 connect to cooling passages 38 on the SC coil to the cryogen transfer coupling 28.

The paragraph beginning at page 12, line 14:

Each HTS racetrack coil winding 34 has generally-straight side portions 40 parallel to a rotor axis 20 and end portions [40] 42 that are perpendicular to the rotor axis. The side portions of the coil are subjected to the greatest centrifugal stresses because they are the portions of the coil furthest from the rotor axis. Accordingly, these side portions of the coil are supported by a support system (shown in Figs. 3 and 4) that secures the

side portions of the coil and counteract the centrifugal forces that act on the coil side portions.

The paragraph beginning at page 14, line 26 through page 14, line 9:

In a dual HTS coil winding arrangement, the rotor core 22 has two pair of recess surfaces 44 for the twin coils. These four recessed surfaces are symmetrically arranged around the rotor core periphery to provide balance during rotation. These surfaces 44 each define a volume 48 in the rotor core extending the length of the rotor core that has a generally right-angled triangular cross section. The hypotenuse of this triangular cross section is an arc of the surface 46 of the rotor core. Each volume 48 receives a side portion 40 of one of the two HTS coil windings 34. The warm iron core 22 has an array of conduit apertures [48] 52 to allow the tension bars to extend through the rotor.

The paragraph beginning at page 18, line 5:

The split clamp 54 at each end of the coil winding includes a pair of opposite plates 56 between which are sandwiched the end section 42 of the coil. The surfaces of the clamp plates 56 includes channels 58 to receive the end sections of the coil windings. The split clamp may be supported by a collar (not shown) or other structural device that holds the clamp to the rotor core and enables the clamp to support the end sections of the HTS coils.

The paragraph beginning at page 18, line 14:

The electrical and cooling fluid couplings 39 [(only the electrical coupling is shown in Figures 3 and 4)] cooling to the coils are at the coil end sections 42. An electrical coupling to the coil is provided at the end section nearest the end shaft having a

collector (not shown) for providing electrical connection to the rotating coils on the rotor. A cooling fluid coupling is provided at the opposite end section of each coil winding so that cryogenic cooling fluid can flow to the coils and heat been removed from the coils in the cooling fluid that is circulated back from the coils and to the cooling system.

The paragraph beginning at page 24, line 1:

FIGURE 5 is a schematic view of dual saddle coil 100 mounted on a rotor 20. The saddle coils each have a similar construction to the racetrack winding shown in Figure 2, in that each coil is formed of wrapped SC coil 36 and has a cooling passage 38 for maintaining the coil at cryogenic temperatures. The saddle coils have a long side section 140 that fit into a longitudinal slot 102 in the rotor core. The slots extend the length of the core 22, and are each on opposite sides of the core. The saddle coils have end sections 154 that are adjacent the ends [56] <u>156</u> of the rotor core. Thus, the saddle coils each extend through the pair of slots in the core and wrap around the ends of the core. A shield 90 covers the coils and provides a vacuum for the coils, and is conductive to prevent electromagnetic fields from the stator from penetrating the sensitive coils.

<u>IN THE CLAIMS</u>

1. (Amended) A rotor for a synchronous machine comprising:

a rotor core having a rotor axis;

a pair of super-conducting coil windings mounted on the rotor core, each of said coil windings in a respective plane that is parallel to and offset from the rotor axis<u>, and</u>

each of said coil windings having an end section extending beyond an end of the rotor core.

3. (Amended) A rotor as in claim 1 wherein the super-conducting coils each have a pair of opposite side sections that are parallel to the rotor axis and [an pair of] coupled to the end section [sections adjacent to an end of the rotor core].

5. (Amended) A rotor as in claim 1 wherein the super-conduction coils [are] included a high temperature super-conducting (HTS) wire extending around the entire coil.